

## Discussion of the Practicability of Low Tire Pressure Warning Technologies

Rea Technologies (hereafter “Rea”) is a technology development company. For several years, amongst other activities, Rea has been examining the issues and problems associated with low tire pressure. Our general approach has been to consider both the technical issues and the human factors issues. Rea came to realize that low tire pressure, for many years if not decades, had been contributing to poor fuel economy, poor vehicle handling, excessive tire wear, premature tire failure and tire debris on roadways (primarily from large trucking rigs). Our goal was the development of a tailored technology to address the problem of tire pressure maintenance. Based on research in the passenger car, trucking and other markets (motorcycle, RV, etc.), Rea came to two major conclusions (neither of which should be surprising to those in the transportation industry) --

- Most drivers, including truckers, do not check their vehicles’ tire pressures often enough. Many passenger car drivers not only do not check pressures, they do not even own a tire gage. Indeed, most passenger car drivers have little understanding of the importance of proper tire pressure.
- The most appropriate time to check (or monitor) tire pressure is when the vehicle is at rest, more precisely when the tires are at ambient temperature, in a static mode.

Further, Rea concluded that a real, acknowledged need for some type of appropriate low tire pressure warning device existed particularly in the trucking industry, driven by fuel and tire costs. Although RF tire pressure monitoring systems have been available for several years, Rea believes that these systems have not been embraced by the trucking industry. And although these systems are not inexpensive, in fact, the cost of these RF systems is not really the barrier to their acceptance (most trucking firms can readily afford such expenditures). Rea believes these systems simply do not meet the needs and existing operations of most trucking firms. Further, although the RF systems have also been available for the passenger car market, there has been virtually no impact in this segment, even though they are available on some high-end new cars. In the passenger car market, the price of these systems is potentially an issue.

Rea concludes that for both the trucking market and the passenger car markets, the available RF systems are simply inappropriate for both technical and human factors reasons. In cab monitoring and warning systems alert the driver at the wrong time, when driving. We concluded that drivers would prefer to be alerted of low tire pressure when the driver is out of the vehicle and prepared to add air. Further, importantly, alerting drivers, while driving, of slightly low tire pressure is viewed as annoying and stressful. The vast bulk of alert instances will be instances of slightly, initial low tire pressure, i.e. not an emergency. We believe that drivers will either come to ignore in-cab alerts at best or disable the systems, at worst, if possible. Further we question the approach of measuring tire pressure in a dynamic mode, precisely, technically, when it is best not measured. In

summary, there seems to have been very little, if any, research and understanding of drivers' habits and preferences.

Based on the above and other, related findings, Rea sought to develop a device specifically tailored to meet the needs of drivers of all types of vehicles. In this regard, Rea has developed a newly patented low tire pressure warning device. Simply, the device is an inexpensive, discrete, "tire level" audio alarm. The device will provide a noticeable audio alarm when the pressure of the tire to which it is attached is below a preset threshold. Drivers and others would be alerted to low pressure if they are within several feet of the subject tire -- and, therefore, at a time when they are prepared to add air. The device is analogous to a home smoke alarm. The technology, as patented, covers a range of configurations; the device can be designed either integrated into a valve stem or as a device which would thread onto a standard valve stem; configurations allow for a battery replaceable model and also a very inexpensive, throwaway model (in which the device would simply be appropriately discarded after battery depletion); other features are embodied, including distinctive, low battery level warning. Rea understands that the requirement for in cab monitoring for passenger cars appears now to be a fait accompli under the Tread Act. But Rea requests for all other tire pressure applications in the spectrum -- trucks, RVs, attached trailers, motorcycles, other -- that some types of effective, discrete, tire level devices (of the type Rea has developed) be allowed under the Tread Act, as enforced.